

## LETTER

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### FIRST RECORD OF TANDEM FLYING IN THE KING VULTURE (*SARCORAMPHUS PAPA*)

Tandem flight is a distinct type of flight formation in which two birds soar for several seconds with one immediately above the other (Mundy et al. 1992, *The vultures of Africa*, Acorn Books, Randburg, South Africa). It has been described in several griffon vulture species (Pennycuik 1972, *Ibis* 114:178–218; Vernon et al. 1982, *Vulture News* 7:17; Mouze and Bagnolini 1995, *Can. J. Zool.* 73:2144–2153). In Eurasian Griffons (*Gyps fulvus*), tandem flights most frequently occur during the breeding season and most often they involve mates, either currently or formerly paired, with the female occupying the upper position (Mouze and Bagnolini 1995). However, in Cape Griffons (*G. coprotheres*), tandem flight does not necessarily involve breeding and it frequently takes place when birds return from foraging (Vernon et al. 1982, Mundy et al. 1992). Several functions of tandem flight have been proposed, including pair bond strengthening (Mouze and Bagnolini 1995), synchronization of breeding, and the establishment of social dominance (Mundy et al. 1992). Tandem flight has not previously been reported to occur in cathartid vultures.

My observations of tandem flight in King Vultures (*Sarcoramphus papa*) were made during a long-term study conducted at Hato Las Nieves (6°35'N, 66°12'W), Sabana Nueva, Estado Bolívar, Venezuela between 1994–2000. The valley of Las Nieves is about 20 km long and 8–9 km wide and is dominated by lowland shrub savanna at elevations ranging from 220–260 m. Bordering mountains are covered with undisturbed primary forest and reach elevations of 1600 m on the west and 1880 m on the north. All observations were made at this site on two different occasions using 10 × 50 binoculars.

On 13 July 1995 at 1005 H on a clear day, a juvenile King Vulture, probably 3–4 yr old judging from its white underparts (Clinton Eitniear 1996, *J. Raptor Res.* 30:35–38), was sighted approaching Las Nieves from the southwest. An adult was higher and several body lengths behind, having come from a more westerly direction. As the two birds reached the ridge, the adult swooped down very close to the juvenile positioning itself for about 2–3 sec immediately above the young vulture. Approximately 1.5 km from the ridge, the adult lowered its feet, swooped down a second time, and held a close tandem position for about 2 sec. As the two separated, the adult soared eastward over the valley and the juvenile rapidly lost altitude in a gliding descent across the foothills, and then continued to glide above the gallery forest for >1 km until it disappeared from view.

On 17 August 1997 at 1222 H on a slightly hazy day, two pairs of King Vultures soared into the valley from the southwest. The two pairs flew in parallel separated by 4–5 wingspans (8–10 m) with one bird in each pair positioned about 1.5 wingspans above and slightly behind its partner. The vultures maintained strict formation while gliding and turning abruptly, often clockwise, at right angles relative to the ground. Their flight, which took place over the foothills, was similar to that described for African vultures gliding into a landing by flying upwind, crosswind, and downwind (Tucker 1991, *Ibis* 108:1–7). After briefly circling on a thermal at the edge of the savanna, the four King Vultures paired again and took up the previous formation. The pairs then went east for about 1.5 km. During this segment of the flight, the upper bird in the pair nearest me suddenly lowered its feet, swooped down, and flew in close tandem with its partner for 2–3 sec before regaining the formation. Shortly afterwards all four vultures abruptly turned and went south for about 1 km, turned again, and went southwest. During the latter segment, the upper bird in the pair nearest me suddenly lowered its feet and again dropped down to a close tandem position for 2–3 sec. It resumed flight formation and the two pairs continued straight ahead crossing the ridge near their point of arrival.

Since the first King Vulture tandem flights took place at considerable distance, I could not determine if they involved aggressive interactions. Nevertheless, aggressive aerial pursuits are common in Andean Condors (*Vultur gryphus*) with adults diving vertically on immature birds trying to strike them on their backs with their feet (McGahan 1972, *Biology and ecology of the Andean Condor*, Ph.D. dissertation, Univ. Wisconsin, Madison, WI U.S.A.). In fact, the upper bird in Cape Griffon tandems often tries to strike the lower one with its feet and may even knock it off course (Mundy et al. 1992). On the other hand, tandem flights in Eurasian Griffons are often terminated when one bird deviates from its rectilinear path even in the absence of physical contact (Mouze and Bagnolini 1995).

The strict intra- and inter-pair formation maintained between the two pairs of vultures during the second observation led me to believe that the flight behavior was an aerial display, possibly linked to breeding. Twice during the same period (June–August), I saw an adult King Vulture briefly take up the typical courtship posture (Schlee 1987, *C.R. Acad. Sci., Paris, Ser. III*, 304:207–212). The two tandem episodes within the display did not appear to be ag-

gressive, although it cannot be ruled out that the upper bird was trying to strike the lower bird with its feet and thus exert social dominance. It is plausible that the two tandem flights may have been performed for aerodynamic purposes to allow the upper bird to keep the spacing or the speed necessary for maintaining strict flight formation.

I would like to thank I. de Angelis and the late Y. Carbonell for their hospitality at Las Nieves and permission to conduct the King Vulture study on their property.—**Marsha A. Schlee, Muséum National d'Histoire Naturelle, Ménagerie du Jardin des Plantes, 57 rue Cuvier, 75005 Paris, France.**